



Social participation and self-rated psychological health: A longitudinal study on BHPS

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ABSTRACT

Although social capital has been hypothesized to have positive influence on psychological health, a relationship between social capital dimensions and psychological wellbeing has rarely been found. This longitudinal study investigates the relationship between social participation in associations and self-rated psychological health. The paper uses five waves of the British Household Panel Survey (BHPS) from 1991 to 1995 (unbalanced panel N=45,761). Ordered logit fixed effect methods were used to study the longitudinal link between structural social capital (being a member, active, and both a member and active in associations) and self-rated psychological health assessed by single items of the General Health Questionnaire (GHQ-12) controlling for age, marital status, household size, number of children, education, income, economic status, number of visits to the GP and health problems. The paper shows that being only a member and only active in associations has no statistical relationship with almost all the items of the GHQ-12. Instead, being both a member and active in associations is linked to all “positive” items of self-rated psychological health and to two main “negative” items of psychological wellbeing. These findings highlight the protective role of being both a member and active in associations against poor psychological health outcomes.

1. Introduction

The public health literature has witnessed a recent increase in the number of empirical papers, which test the association between social interaction, social participation in various kinds of associations and social trust (i.e. social capital), and psychological health.

Defined by Putnam et al. (1993) as features of social organization such as networks, norms and social trust that facilitate coordination and cooperation for mutual benefit, the concept of social capital has a structural and cognitive dimension (Uphoff, 1999). Structural social capital deals with individuals' behaviours and mainly takes the form of networks and associations that can be observed and measured through surveys. Cognitive social capital derives from individuals' perceptions, resulting in norms, values and beliefs that contribute to cooperation (Fiorillo & Sabatini, 2015). Psychological health is “a state of wellbeing in which the individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community” (Ding, Berry, & O'Brien, 2015). The General Health Questionnaire (GHQ) (Craig, 2007) provides the most common assessment of psychological well-

being. The GHQ makes available a self-reported measure of mental health and consists of questions regarding the respondent's emotional and psychological health over the past few weeks that precede the interview. It captures current mental health problems in an individual's life (Lordan & Pakrashi, 2014). Available in several versions using 60, 30, 28 or 12 items, the 12-item version (GHQ-12) is the most broadly used screening instrument for common mental disorders, in addition to being a more general measure of psychological wellbeing (del Pilar Sánchez-López & Dresch, 2008).

In this paper we focus on the individual structural dimension of social capital and refer to the definitions of Bourdieu (1980) and Coleman (1988), according to whom social capital is an individual resource available through social participation/social networks. Structural social capital has been hypothesized to have a positive effect on psychological health for several reasons. (i) *Social influence*, regarding the way in which members of social organizations obtain guidance about health-relevant behaviour (physical activity, alcohol consumption or cigarette smoking), which may have a positive influence on mental health (Kawachi & Berkman, 2001); (ii) *social integration*, according to which integration in social organizations may

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have a direct positive effect on psychological states through a sense of purpose, belonging, security and recognition of self-worth and self-esteem (Brunner & Marmot, 1999; Cohen, Underwood, & Gottlieb, 2000); (iii) *social location*, which enhances the likelihood of accessing various forms of support (access to appropriate health information and/or informal health care which, in turn, protect against psychological distress) (Lin, Ye, & Ensel, 1999; Phongsavan, Chey, Bauman, Brooks, & Silove, 2006); (iv) *buffering effect*, according to which social interactions in organizations provide moral and affective support which may reduce either the negative emotional reaction to a stressful event or dampen the psychological responses to stress (Kawachi & Berkman, 2001; Harpham, Grant, & Thomas, 2002).

A number of empirical papers have sought to gauge the link between individual social capital and psychological health. McCulloch (2001) uses the BHPS (1998/1999) to ascertain whether neighbourhood problems, as a measure of social capital, are correlated to the 12-item GHQ as a measure of morbidity. The results show that people in the lowest categories of social capital are more likely to report a risk of psychiatric morbidity than people in the highest. Lindström (2004) studies the association between social participation and trust and self-reported psychological health in Southern Sweden (year 2000): higher trust and social participation are positively associated with self-reported psychological health. Ahnquist, Wamala, and Lindstrom (2012) also analyse, for Sweden, social and economic determinants of psychological distress, employing the GHQ-12 (year 2009). They find: i) a negative association between trust and psychological distress for men and women; ii) a negative correlation between social participation and psychological distress for men. In examining whether social support, social participation and networks, trust and reciprocity are related to psychological well-being (GHQ-12) for Finns, Nieminen et al. (2010) found an association between trust and reciprocity and psychological wellbeing, and between social participation and networks and psychological wellbeing, albeit much weaker. Finally, Bassett and Moore (2013) investigate the association among the psychological and the network dimensions of social capital and depressive symptoms obtained from the 10-item Depression Scale (CES – D Scale): individuals with high levels of trust were less likely to have depressive symptoms.

Elsewhere longitudinal data are used to study the effect of structural and cognitive dimension of social capital on self-rated psychological wellbeing. Giordano and Lindström (2011) investigate the link between interpersonal trust, active social participation, and frequency of talking with neighbours and changes in self-rated psychological health obtained by means of the GHQ-12 with the BHPS (2000/2007). Trust is the only social capital variable that maintains a positive and highly significant effect on self-rated psychological health. Lindström and Giordano (2016) employ data from BHPS pre- and immediately post- the 2008 crisis to compare the buffering effects of generalised trust and social participation against worse psychological wellbeing (GHQ-12) during and after the 2008 financial crisis. The authors found that individuals with low levels of trust had an increased risk of worse psychological wellbeing in 2008 compared to 2007, while social participation was not associated with psychological health.

Moving on from the studies surveyed above, we aimed to test the longitudinal relationship between social participation in associations and self-rated psychological health in the UK. In particular, our contribution to the literature lies in our analysis whether being a member or active, or both a member and active in associations is effectively beneficial for perceived psychological health using a single item of GHQ-12 and ordered fixed effect model specifications between 1991 and 1995.

Our original contribution to the literature is threefold. First, the study uses the 12-item GHQ-12 as separate items instead of considering them as a summary score. To our knowledge, it is the first time that this has been attempted within the field of social capital. Employing as

dependent variables the single items of GHQ-12 allows a clear evaluation of the specific relationship between social participation measures and each component of psychological health, preventing the loss of information that an aggregation method involves. Second, we consider individuals who are both members and active in associations; the combination of the two states can be considered a further measure of social capital. This hitherto unexamined grouping highlights the importance, for the individual's psychological well-being, of both social integration related to being a member of associations and social support linked to the intense person-to-person interactions that such associations supply. Finally, we employ fixed-effect model specifications with a dependent categorical variable as implemented by Baetschmann, Staub, and Winkelmann (2015). Applying a fixed effects estimator in a short panel is a promising solution to accommodate the unobserved heterogeneity as this estimator, imposing that the heterogeneity is time-invariant, permits unbiased coefficients to be estimated.

2. Methods

2.1. Data

The BHPS is a longitudinal survey of randomly selected private households in Great Britain. Individuals within selected households are interviewed annually with a view to identifying social and economic changes within the British population. The BHPS data contain information on various domains of the respondents' lives, ranging from income to.

jobs, household consumption, education, health, and social and political values. We use waves 1–5 (years 1991/1995) because our variables of interest concerning social participation in associations are continuously present in the waves in question. Table 1 shows the participation rates and the individuals observed across the waves. Bar charts of social participation and psychological health variables across the waves are provided in Appendix A.

2.2. Dependent variables

The dependent variables are self-rated psychological health from the GHQ-12. The twelve items are all ordinal variables varying from 1 to 4. These variables are:

- 1) *ghqa: concentration. Have you recently been able to concentrate on whatever you are doing?*
- 2) *ghqb: loss of sleep. Have you recently lost much sleep over worry?*
- 3) *ghqc: playing a useful role. Have you recently felt that you were playing a useful part in things?*
- 4) *ghqd: capable of making decisions. Have you recently felt capable of making decisions about things?*
- 5) *ghqe: constantly under strain. Have you recently felt constantly under strain?*
- 6) *ghqf: problem overcoming difficulties. Have you recently felt you could not overcome your difficulties?*
- 7) *ghqg: enjoy day-to-day activities. Have you recently been able to enjoy your normal day-to-day activities?*

Table 1
Participation rates and individuals observed across waves.

	1991	1992	1993	1994	1995
Total # obs	10,264	9845	9600	9481	9249
Response #	9822	9352	8904	8965	8718
Non-response	4.31%	4.99%	7.25%	5.44%	5.74%
Unbalanced non-response	9822	19,174	28,078	37,043	45,761

Notes: BHPS, UK; individuals aged 16 and over.

- 8) *ghqh*: ability to face problems. Have you recently been able to face up to problems?
- 9) *ghqi*: unhappy or depressed. Have you recently been feeling unhappy or depressed?
- 10) *ghqj*: losing confidence. Have you recently been losing confidence in yourself?

The 12-item GHQ-12 comprises six “positive” and six “negative” items concerning the past few weeks (Hu, Stewart-Brown, Twigg, & Weich, 2007). Positive items include 1, 3, 4, 7, 8 and 12 listed above. The remainder are negative items. Positive items have as responses: “Better than usual”, “Same as usual”, “Less than usual” and “Much less than usual”. Responses to negative items are: “Not at all”, “No more than usual”, “Rather more than usual” and “Much more than usual”. All items are rescored so that a low score is indicative of endorsement of these items (i.e. Better than usual/Not at all), while higher scores indicate greater difficulty of these items (i.e. Much less than usual/Much more than usual). Table 2 illustrates descriptive statistics.

2.3. Social participation

Social participation within organizations is measured by asking the respondent the following questions: i) “are you currently a member of any of the kinds of organizations on this card?”; ii) “are you currently active in any of the kinds of organizations on this card?”.

We consider the following kinds of organizations: environmental groups, parents associations, tenant’s groups, religious groups, voluntary groups, other community groups, social groups, sports clubs, women institutes, women’s groups, other organizations.

We build three binary independent variables. *Member* equals 1 if the respondent is a member of at least one of the organizations listed above. *Active* equals 1 if the respondent is active in at least one of the organizations listed above. *Member*Active* is equal to 1 if the respondent is both a member and active at least in one of the organizations listed above.

2.4. Control variables

In order to control for other factors that might simultaneously influence psychological health and social participation, we include in the analysis a full set of socio-demographic variables (Giordano & Lindström, 2011). At the individual level, we account for age (*c_age*),¹ marital status (*married*), the number of individuals living in the household (*hsize*), the number of children in the household (<16 years) (*children*), educational level (*o_cse*, *hnd_a*, *degree*, with no qualification as reference category), the equivalent uninflated income (in logarithm), self-defined current economic status (*employed*, *unemployed*, *retired*, *otheremp*). We also consider the number of visits to a GP or family doctor (*hl2gp*) and whether the respondent reports at least one of the following health problems: arms, legs, hands, sight, hearing, skin conditions/allergy, chest, heart/blood pressure, stomach or digestion, or diabetes (*hfpr*). Regional and year fixed effects are also included (with Inner London and year 1991 as reference categories). Summary statistics are reported in Table 3.

2.5. Methodology

Riedl and Geishecker (2014) report the absence of a consistent estimator for the fixed effect ordered dependent variable. They list six estimation strategies adopted to circumvent this problem for ordered logit, finding that the smallest biased and most efficient estimator for

Table 2

Twelve-item GHQ descriptive statistics.

	mean	sd	min	max
1) ghqa: concentration	2.162	0.549	1	4
2) ghqb: loss of sleep	1.856	0.787	1	4
3) ghqc: playing a useful role	2.017	0.587	1	4
4) ghqd: capable of making decisions	1.957	0.507	1	4
5) ghqe: constantly under strain	2.117	0.789	1	4
6) ghqf: problem overcoming difficulties	1.812	0.716	1	4
7) ghqg: enjoy day-to-day activities	2.130	0.589	1	4
8) ghqh: ability to face problems	2.021	0.493	1	4
9) ghqi: unhappy or depressed	1.919	0.824	1	4
10) ghqj: losing confidence	1.645	0.744	1	4
11) ghqk: believe in self-worth	1.393	0.650	1	4
12) ghql: general happiness	2.013	0.570	1	4

Notes: BHPS, UK, years 1991–1995; individuals aged 16 and over.

- 11) *ghqk*: believe in self-worth. Have you recently been thinking of yourself as a worthless person?
- 12) *ghql*: general happiness. Have you recently been feeling reasonably happy, all things considered?

the ordered logit with fixed effects is implemented by Baetschmann et al., (2015). Although this is a recent estimation strategy it was already used in other studies (Brown & Gray, 2015; Dickerson et al., 2014; Frijters & Beaton, 2012; Geishecker et al., 2012; Mujic & Frijters, 2015).

All strategies to estimate the fixed effects ordered logit simplify the problem, transforming the ordered into a binary variable. There is known to exist a logit fixed effect estimator (Chamberlain, 1980); assuming that the dependent variable is independent of the fixed effect, it makes the fixed effect disappear. For all such methods, the observations that do not change their original order value do not contribute to coefficients estimation.

Baetschmann et al. (2015) suggest a two-stage approach: “Blow Up and Cluster” (Hereafter BUC). In the first stage, BUC replaces each observation with *k*-1 observations (*k* are the number of ordered categories) and dichotomises each observation obtained. In the second stage, the fixed effect logit is used over the entire sample. Observations are dependent by construction and to overcome this problem, estimation uses the individual cluster.

We implement BUC estimation using the twelve items individually (*ghq-12*) as dependent variables to ascertain whether *member*, *active*, and *member*active* are linked to each *ghq*, controlling for all other variables (*Z*);

$$ghq_{it} = \alpha + \beta_1 member_{it} + \beta_2 active_{it} + \beta_3 member_{it} * active_{it} + \gamma Z_{it} + u_i + \varepsilon_{it} \quad (1)$$

We test for attrition bias on avoiding the risk of selection bias. We implement the added variable test (Verbeek & Nijman, 1992), consisting in adding a dichotomous variable assessing whether, in the next wave, the observation is in the panel for each single model. If the attrition variable is significant this means that the attrition is not missing at random. In our case only in the regression of *problem in overcoming difficulties* (*ghqf*) is there a significant effect of attrition on our models.

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3. Results

In this section, we present the estimations of the empirical models described in Section 2. Table 4, Columns (1–6) and Table 5, Columns

¹ Introducing at the same time a variable and its square in a regression can induce a relative high level of collinearity (Chatterjee & Hadi, 2015). To avoid this problem we centered the variable age and its square, subtracting their average.

Table 3
Descriptive statistics of social participation and all control variables.

		mean	sd	min	max
Member	= 1 if a member of at least one of the organizations	0.515	0.500	0	1
Active	= 1 if active in at least one the organizations	0.478	0.500	0	1
Member*Active	= 1 if a member and active	0.413	0.492	0	1
C_age	= demeaned age=age-mean(age)	-0.315	18.26	-29.01	52.99
Married	= 1 if married	0.569	0.495	0	1
Hsize	= number of household members	2.880	1.355	1	11
Children	= number of children in household	0.592	0.947	0	9
Degree	= 1 if a graduate	0.088	0.283	0	1
Hnd_a	= 1 if possessing a high school diploma	0.302	0.459	0	1
O_cse	= 1 if lower than lower school	0.109	0.312	0	1
Lnincome	= logarithm of equivalised real income, adjusted using the Retail Price Index and McClement's scale to adjust for household size and composition	9.219	0.716	-0.524	12.04
Employed	= 1 if he/she works in the year	0.588	0.492	0	1
Unemployed	= 1 if unemployed in the year	0.333	0.471	0	1
Retired	= 1 if retired in the year	0.038	0.190	0	1
Otheremp	= 1 if neither employed nor unemployed either retired	0.041	0.199	0	1
Hl2gp	= number of visits to GP: 1=none, 5=more than ten	2.375	1.188	1	5
Hfpr	=1 if health or physical problems	0.493	0.500	0	1

Notes: BHPS, UK, years 1991–1995; individuals aged 16 and over.

(7–12), report the results of the fixed effects ordered logit models, using the longitudinal dataset previously described, for the single items of the GHQ-12. In all columns, we show all the predictors. For each item, we present coefficients and standard errors (in parentheses), which are corrected for heteroskedasticity through individual cluster level. Overall, our data highlight four major findings.

First, the estimates of the parameters associated to *active_{it}* are not statistically significant in almost all the GHQ-12 items. Individuals who are active in at least one association have a higher probability of responding, respectively, “better than usual” in *concentration* (ghqa) ($p < 0.05$) and “much more than usual” in *loss of sleep* (ghqb) ($p < 0.05$). The evidence on the other GHQ-12 items seems in line with Giordano and Lindström (2011) and Lindström and Giordano (2016) who failed to find for the whole UK population an association between being active in associations and indexes of self-rated psychological health obtained from GHQ-12.

Second, the estimates of the parameters associated to *member_{it}* are only statistically significant in one item of the GHQ-12. In particular, the results indicate that being a member of at least one association is positively correlated to a higher likelihood of reporting “better than usual” in *believe in self-worth* (ghqk) ($p < 0.05$).

Third, the estimates of the parameters associated to *member_{it} * active_{it}* are statistically significant in most of the GHQ-12 items with the exception of *loss of sleep* (ghqb), *constantly under strain* (ghqe), *problem overcoming difficulties* (ghqf) and *unhappy or depressed* (ghqi). Hence, being a member and active raises the likelihood of stating “better than usual” in the following “positive” item: *concentration* (ghqa) ($p < 0.01$), *playing a useful role* (ghqc) ($p < 0.01$), *capable of making decisions* (ghqd) ($p < 0.10$), *enjoy day-to-day activities* (ghqh) ($p < 0.001$), *ability to face problems* (ghqh) ($p < 0.001$) and *general happiness* (ghql) ($p < 0.05$). Moreover, being a member and active decreases the probability of responding “much more than usual” in the “negative” items: *losing confidence* (ghqj) ($p < 0.05$) and *believe in self-worth* (ghqk) ($p < 0.05$).

Fourth, few parameters of the control variables are statistically significant in more items of the GHQ-12 psychological health. In line with previous empirical studies, covariates that protect against worse self-rated psychological health include marital and employed status (statistically significant in almost all items). By contrast, the number of visits to the GP worsens self-rated psychological health (in all items $p < 0.001$), and reporting at least one health problem increases the probability of responding “much more than usual” in the “negative” items: *loss of sleep* (ghqb) ($p < 0.01$), *constantly under stress* (ghqe) (p

< 0.05), *losing confidence* (ghqj) ($p < 0.001$).

Regarding the other covariates, the number of children decreases the likelihood of stating “much more than usual” in *loss of sleep* (ghqb) ($p < 0.01$), *unhappy or depressed* (ghqi) ($p < 0.001$), *losing confidence* (ghqj) ($p < 0.10$) and *believe in self-worth* (ghqk) ($p < 0.10$). Moreover, the number of children raises the probability of stating “better than usual” in *capable of making decisions* (ghqd) ($p < 0.05$). Further, being a graduate and having a high school diploma reduce the likelihood of responding “much more than usual” in *problem overcoming difficulties* (ghqf) ($p < 0.05$). Income decreases the probability of stating “much more than usual” in *loss of sleep* (ghqb) ($p < 0.10$) and reduces the likelihood of stating “better than usual” in *playing a useful role* (ghqc) ($p < 0.05$). Finally, being retired is associated with a higher probability of stating “better than usual” in *capable of making decisions* (ghqd) ($p < 0.05$) and a lower likelihood of stating “much more than usual” in *constantly under stress* (ghqe) ($p < 0.01$).

4. Discussion

The aim of the present longitudinal panel study was to analyse whether being a member, active, and both a member and active, in associations in the UK has positive relationship with self-rated psychological health over time using single items of the GHQ-12, ordered logit fixed effects models and controlling for socioeconomic characteristics.

The evidence on socioeconomic characteristics shows that marital and employment status are positively correlated with psychological wellbeing. These results support previous research showing that marriage and employment protect against worse psychological health over time. Marriage reduces morbidity and mortality, risk-taking behaviour and stress. It also provides a level of health protection via emotional and financial support (Giordano & Lindström, 2011; Wyke & Ford, 1992). Employment reduces physical and mental health problems and improves psychological wellbeing (Marmot, Ryff, Bumpass, Shipley, & Marks, 1997; Wang, Scmitz, & Dewa, 2010). The evidence on the link between parenthood and psychological health shows that the presence of children in the household reduces loss of sleep, increases self-worth and makes individuals confident, capable of making decisions and happy. These results are in line with previous research in which parenting was associated with increased psychological wellbeing (Hansen, Slagsvold, & Moum, 2009). Our results also indicate that education is positively associated with overcoming difficulties, providing little support for previous studies regarding socioeconomic status and mental health outcomes (Wang et al., 2010).

Table 4
Self-rated psychological health estimation: items 1 to 6.

	(1)	(2)	(3)	(4)	(5)	(6)
	ghqa	ghqb	ghqc	ghqd	ghqe	ghqf
Member	-0.063 (0.061)	0.048 (0.052)	-0.032 (0.058)	-0.063 (0.062)	0.045 (0.050)	0.003 (0.052)
Active	-0.147 [*] (0.067)	0.113 [*] (0.057)	-0.069 (0.067)	-0.028 (0.069)	0.086 (0.054)	0.004 (0.056)
Member [†] Active	-0.146 ^{***} (0.047)	0.022 (0.042)	-0.151 ^{**} (0.046)	-0.085+ (0.049)	0.025 (0.040)	-0.032 (0.042)
C_age2	0.001+ (0.000)	-0.000 (0.000)	0.000 (0.000)	0.001+ (0.000)	-0.001 ^{***} (0.000)	-0.000 (0.000)
C_age	-0.022 (0.071)	-0.066 (0.060)	0.006 (0.064)	-0.093 (0.073)	0.029 (0.058)	0.073 (0.061)
Married	-0.198 [*] (0.089)	-0.290 ^{***} (0.077)	-0.259 ^{**} (0.085)	0.034 (0.089)	-0.212 ^{**} (0.076)	-0.239 ^{**} (0.081)
hhsz	0.017 (0.029)	-0.031 (0.028)	-0.029 (0.029)	0.038 (0.030)	-0.021 (0.026)	-0.004 (0.027)
Children	0.011 (0.041)	-0.119 ^{**} (0.036)	-0.052 (0.040)	-0.088 [*] (0.041)	-0.013 (0.034)	-0.053 (0.035)
DEGREE	0.024 (0.268)	-0.170 (0.254)	0.006 (0.226)	-0.237 (0.238)	-0.291 (0.226)	-0.481 [*] (0.233)
HND_A	-0.002 (0.120)	-0.068 (0.102)	0.012 (0.110)	-0.089 (0.116)	-0.171+ (0.100)	-0.224 [*] (0.103)
O_CSE	-0.423 [*] (0.185)	-0.067 (0.176)	-0.027 (0.196)	0.047 (0.177)	-0.232 (0.168)	-0.232 (0.171)
LNINCOME	-0.052 (0.036)	-0.057+ (0.033)	0.082 [*] (0.035)	0.031 (0.035)	-0.037 (0.030)	-0.035 (0.031)
Employed	-0.210 [*] (0.089)	-0.137+ (0.081)	-0.718 ^{***} (0.091)	-0.458 ^{***} (0.092)	-0.108 (0.078)	-0.126 (0.081)
Unemployed	-0.052 (0.083)	-0.011 (0.074)	-0.026 (0.082)	-0.175 [*] (0.085)	-0.066 (0.071)	0.075 (0.075)
Retired	-0.090 (0.118)	0.013 (0.100)	-0.007 (0.114)	-0.291 [*] (0.129)	-0.298 ^{**} (0.098)	0.029 (0.103)
hl2gp	0.208 ^{***} (0.018)	0.137 ^{***} (0.015)	0.120 ^{***} (0.017)	0.162 ^{***} (0.018)	0.144 ^{***} (0.015)	0.131 ^{***} (0.015)
Hfpr	0.017 (0.046)	0.107 ^{**} (0.040)	-0.011 (0.046)	-0.012 (0.048)	0.096 [*] (0.038)	0.048 (0.041)
Region	YES	YES	YES	YES	YES	YES
Year	YES	YES	YES	YES	YES	YES
# Individuals	5374	7181	5744	5067	7718	7287
Individual-year obs.	32,794	46,918	36,229	29,993	49,379	45,453
BuC observations	130,992	130,992	130,992	130,992	130,992	130,992
pseudo R ²	0.013	0.013	0.016	0.012	0.010	0.010
AIC	24,086.6	35,115.5	26,493.0	21,972.6	37,082.3	34,090.5
BIC	24,405.7	35,448.2	26,815.9	22,288.3	37,417.0	34,422.1
ll	- 12,005.3	- 17,519.7	- 13,208.5	- 10,948.3	- 18,503.1	- 17,007.3
chi2	211.5	280.9	264.9	193.9	236.7	224.4
Attrition test	-0.27	-0.03	-0.26	-1.36	-0.72	-2.03 [*]

Notes: Standard errors in parenthesis and + p < 0.10;

BHPS, UK, years 1991–1995; individuals aged 16 and above.

* p < 0.05.

** p < 0.01.

*** p < 0.001.

The literature on money and mental health is controversial and many studies conclude that the link between money and happiness is slight or non-existent (see [Nettle \(2005\)](#) and [Layard \(2005\)](#)). It could be said that “high income improves evaluation of life but not emotional well-being” ([Kahneman & Deaton, 2010](#)). Our results seem in line with previous investigations, income not being statistically significant in hardly any of the GHQ-12 items.

The literature on the effects of retirement on well-being is also conflicting. The effect is considered likely adverse when the key role that work plays in the life of adults is emphasized ([Henry, 1971](#)). Our results show that retirement produces a positive impact on people's well-being; in particular, being retired has a positive relationship with the capacity of making decisions and a negative association with constantly under stress. Such effects of retirement probably depend on the fact that retirees have fewer demands on their time, more control over their lives, less pressure, less stress ([Midanik, Soghikian, Ranson, & Tekawa, 1995](#)) and a less hectic lifestyle.

Increasing the number of visits to the GP or family doctor decreases

psychological wellbeing. This result is probably influenced by the state of stress related to reasons leading people to go to see a family doctor. People go to the doctor when they feel ill and when they think they are ill, and per se feelings of being ill and of believing to be ill are stressful. Thus increasing the number of visits to GP is likely to decrease psychological wellbeing. Health problems also increase the likelihood of stating worse psychological health. Loss of sleep, constantly under stress, and losing confidence are associated with health or physical problems. These findings support previous empirical investigations ([Schultz, O'Brien, & Tadesse, 2008](#)).

After considering socioeconomic characteristics, our findings on active participation in associations show no correlation on single items of the GHQ-12, with two exceptions. These results emphasize that active participation in associations without membership does not lead to better psychological health. A first explanation may be that performing an activity in the name and on behalf of an association without sharing the membership of a social group does make people feel isolated from the group. This feeling of social isolation may preclude better psychological

Table 5
Self-rated psychological health estimation: items 7 to 12.

	(7) ghqg	(8) ghqh	(9) ghqi	(10) ghqj	(11) ghqk	(12) ghql
Member	-0.038 (0.057)	-0.105 (0.066)	-0.031 (0.052)	-0.044 (0.054)	-0.125 ⁺ (0.064)	-0.050 (0.059)
Active	-0.063 (0.062)	-0.052 (0.070)	0.048 (0.055)	0.030 (0.059)	0.062 (0.068)	-0.077 (0.061)
Member* Active	-0.155 ^{***} (0.046)	-0.176 ^{***} (0.051)	-0.028 (0.040)	-0.097 ⁺ (0.044)	-0.103 ⁺ (0.050)	-0.112 ⁺ (0.046)
C_age2	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
C_age	-0.005 (0.065)	0.074 (0.076)	0.019 (0.059)	0.027 (0.064)	-0.040 (0.075)	-0.038 (0.067)
Married	-0.146 ⁺ (0.084)	-0.115 (0.095)	-0.358 ^{***} (0.077)	-0.377 ^{***} (0.084)	-0.335 ^{***} (0.098)	-0.304 ^{***} (0.083)
hhsz	0.012 (0.029)	0.025 (0.033)	-0.002 (0.026)	-0.001 (0.029)	-0.019 (0.033)	-0.011 (0.028)
Children	-0.056 (0.039)	-0.064 (0.044)	-0.122 ^{***} (0.035)	-0.067 ⁺ (0.038)	-0.073 ⁺ (0.044)	-0.062 (0.038)
DEGREE	0.082 (0.240)	0.123 (0.260)	-0.180 (0.228)	-0.093 (0.241)	0.248 (0.294)	-0.047 (0.234)
HND_A	-0.093 (0.110)	0.028 (0.121)	-0.096 (0.098)	-0.034 (0.108)	-0.000 (0.124)	-0.004 (0.112)
O_CSE	0.078 (0.174)	-0.089 (0.181)	-0.177 (0.160)	-0.343 ⁺ (0.172)	0.215 (0.180)	0.057 (0.170)
LNINCOME	0.028 (0.034)	-0.040 (0.039)	-0.048 (0.031)	-0.004 (0.033)	-0.060 (0.037)	-0.002 (0.035)
Employed	-0.139 (0.084)	-0.339 ^{***} (0.091)	-0.286 ^{***} (0.077)	-0.399 ^{***} (0.086)	-0.442 ^{***} (0.097)	-0.312 ^{***} (0.087)
Unemployed	0.015 (0.078)	-0.030 (0.086)	-0.056 (0.071)	0.025 (0.079)	0.002 (0.088)	-0.059 (0.080)
Retired	-0.094 (0.113)	-0.100 (0.126)	-0.033 (0.101)	-0.038 (0.109)	0.014 (0.125)	-0.150 (0.124)
hl2gp	0.193 ^{***} (0.017)	0.135 ^{***} (0.019)	0.159 ^{***} (0.015)	0.143 ^{***} (0.016)	0.123 ^{***} (0.018)	0.099 ^{***} (0.017)
Hfpr	0.025 (0.045)	0.033 (0.051)	0.134 ^{***} (0.039)	0.048 (0.042)	0.003 (0.050)	0.034 (0.045)
Region	YES	YES	YES	YES	YES	YES
Year	YES	YES	YES	YES	YES	YES
# Individuals	5933	4672	7559	6706	5314	5764
Individual-year obs.	36,713	28,215	50,904	43,309	34,473	35,605
BuC Observations	130,992	130,992	130,992	130,992	130,992	130,992
pseudo R ²	0.012	0.010	0.015	0.014	0.012	0.007
AIC	27,016.2	20,600.0	38,171.5	32,343.1	25,620.2	26,254.1
BIC	27,339.6	20,913.4	38,507.4	32,672.8	25,941.2	26,576.4
ll	- 13,470.1	- 10,262.0	- 19,047.8	- 16,133.6	- 12,772.1	- 13,089.1
chi2	217.9	140.1	357.5	272.1	191.6	123.4
Attrition test	-0.74	-0.45	-0.85	0.54	-1.52	-1.53

Notes: Standard errors in parenthesis and + p < 0.10; **p < 0.01;

BHPS, UK, years 1991–1995; individuals aged 16 and above.

* p < 0.05.

*** p < 0.001.

wellbeing. Second, active participation in associations without membership may indicate “poor” social relationships, i.e. poor person-to-person interactions. People with poor social ties are likely to have less social support; poor interactions do not help them to have better psychological health. Finally, active engagement without membership may have simultaneously protective and damaging effects on psychological health. The former through social support based on intense person-to-person interactions, the latter through the feeling of social isolation that draws from not sharing membership of the group.

This evidence is in line with previous empirical investigations conducted on the UK with BHPS data by [Giordano and Lindström \(2011\)](#) and [Lindström and Giordano \(2016\)](#) which use active participation in associations as structural social capital and an index of self-rated psychological health obtained from the GHQ-12 as dependent variable.

The results on membership in associations do not show statistical significant correlation with GHQ-12 items, with one exception. Being a member of associations decreases the probability of responding “much more than usual” in believe in self-worth. This evidence may show that although membership in associations does not necessarily impose

strong personal relationships, it nevertheless provides a sense of purpose, belonging and social identity that are important for the promotion of self-esteem.

Our original findings add to the increasing volume of research demonstrating that being both a member and active in associations has longitudinal associations with most items of the GHQ-12 psychological health. Indeed, being both a member and active is positively associated with a higher likelihood of stating “better than usual” in concentration, playing a useful role, capable to make decision, enjoy day to day activities, ability to face problems, general happiness and with a lower probability of reporting “much more than usual” in losing concentration and believe in self-worth.

These findings highlight the protective role of being both a member and active in associations against poor psychological health outcomes. First, individuals who are members of formal social groups feel a sense of purpose, belonging and social identity that are important for the promotion of their psychological health. Second, belonging promotes broader social networks: membership increases the likelihood of constructing and maintaining strong personal relationships in social net-

works. Broader social networks enhance the probability of accessing various forms of moral, emotional and financial support which may reduce either negative emotional reaction to a stressful event or dampen the psychological responses to stress. Finally, membership with active engagement may have simultaneously a high protective effect on psychological health through social support based on intense person-to-person interactions and through the feeling of social integration that comes from sharing membership of the group.

4.1. Strengths and weaknesses

A major strength of this study is that we employed the indicator of social capital that most closely fits with the definition of social capital used in the paper, i.e. social participation in associations, which has the advantage of simplifying the analysis and the interpretations of the results. Moreover, our methodological approach has some advantages on cross sectional and time series, as panel data have more accuracy on parameter estimation and generate more correct predictions. In addition, applying the fixed effects estimator in a short panel is a promising solution to accommodate the unobserved heterogeneity as this estimator, imposing that the heterogeneity is time-invariant, permits unbiased coefficients to be estimated. Furthermore, this is the first study within the field of social capital that uses the 12-item GHQ-12 as separate items instead of considering them as a summary score (see [Giordano and Lindström \(2011\)](#), [Lindström and Giordano \(2016\)](#)). Employing the single items of GHQ-12 as dependent variables allows us to evaluate clearly the specific relationship between social participation measures and each component of psychological health, preventing the loss of information that an aggregation method involves. Finally, we consider the combined term *member*active* as a further measure of social capital. This combination has not been examined in previous studies and shows that, for the individual's psychological well-being, what is important is both social

integration related to being a member of associations and social support linked to intense person-to-person interactions that such associations supply.

As concerns weaknesses, due to the availability of the data set, our first limitation is the use of social participation in associations as the only component of social capital, without considering other measures of structural social capital, such as friendship, and measures of cognitive social capital, like trust. In so doing we lose the multi-dimensionality of the concept of social capital. A second limitation of the study is that the BHPS sample reflects the UK population. Hence, our findings are not generalizable to other European populations. Nevertheless, our main aim was to demonstrate that, using different measures of social participation and psychological health as well as empirical methods, social participation in associations, i.e. being both a member and active, is a relevant predictor of psychological health.

5. Conclusions

Our longitudinal study suggests that structural social capital, i.e. being both a member and active in associations, is a major predictor of psychological wellbeing. We argue that social integration and social support could be the mechanisms by which social participation in associations influences psychological health. Policy makers who aim to reduce social inequalities in health should strengthen community participation by increasing formal participation in associations.

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Appendix A

See Fig. A1.

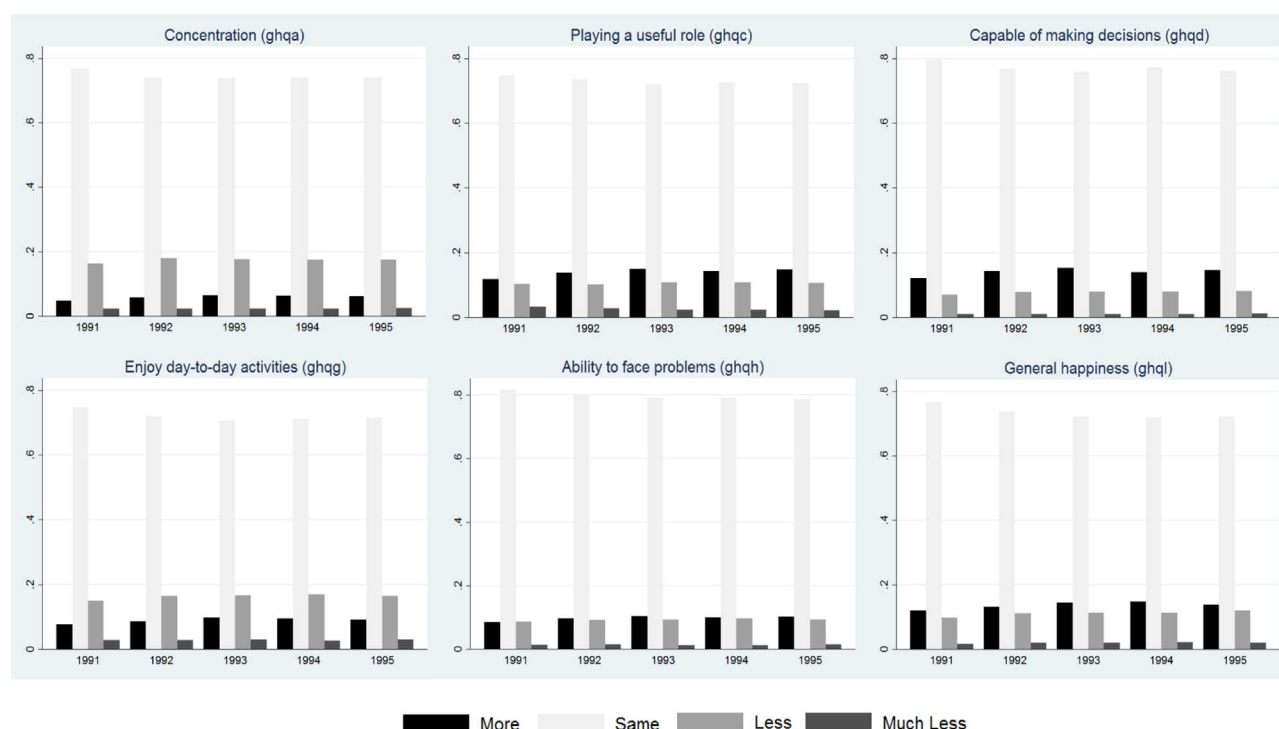


Fig. A1. Bar charts of social participation and psychological health variables across the waves.

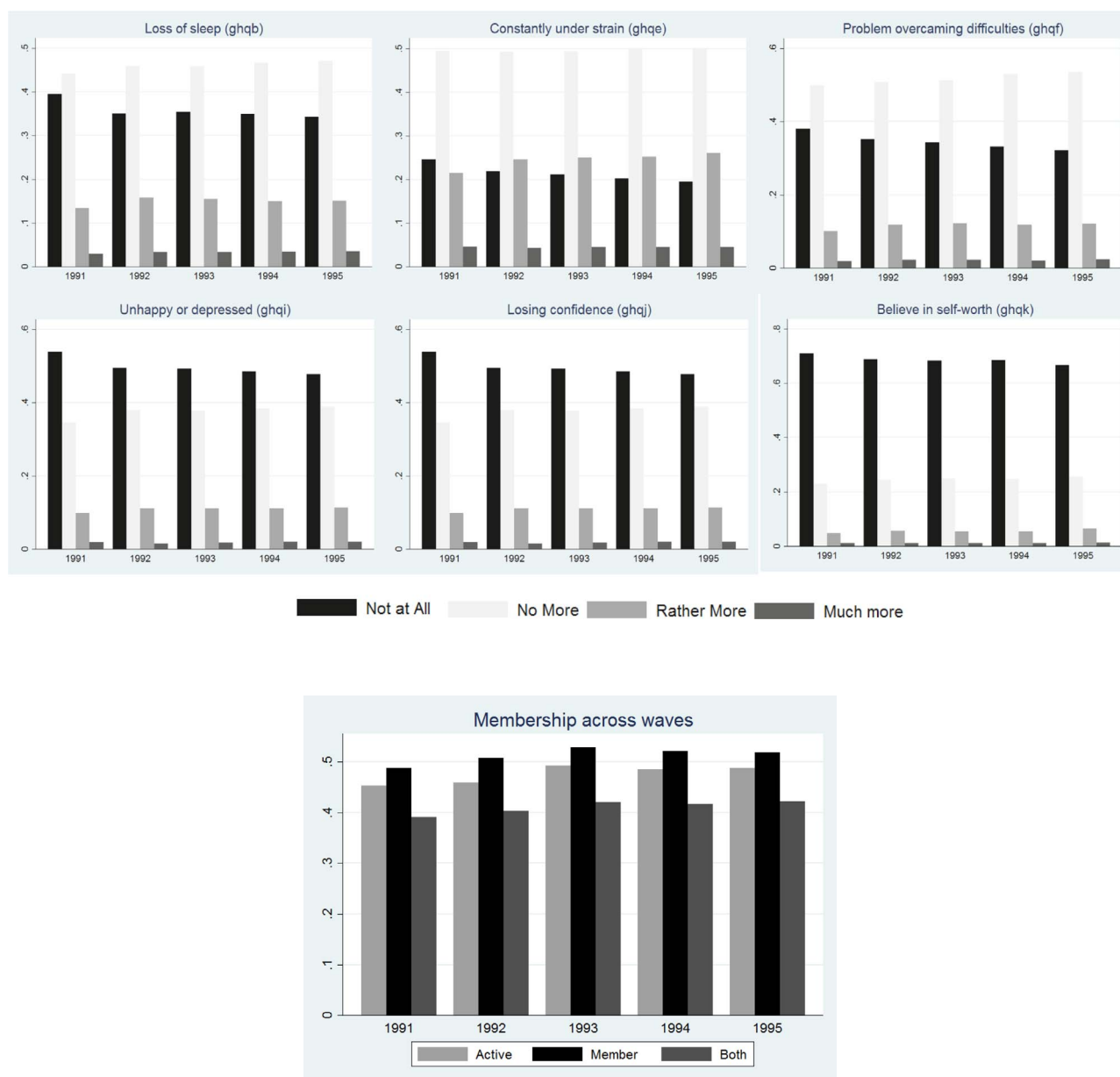


Fig. A1. (continued)

References

- Ahnquist, J., Wamala, S. P., & Lindstrom, M. (2012). Social determinants of health – A question of social or economic capital? Interaction effects of socioeconomic factors on health outcomes. *Social Science Medicine*, 74, 930–939.
- Baetschmann, G., Staub, K. E., & Winkelmann, R. (2015). Consistent estimation of the fixed effects ordered logit model. *Journal of the Royal Statistical Society: Series A (Statistics in Society)*, 178, 685–703.
- Bassett, E., & Moore, S. (2013). Social capital and depressive symptoms: The association of psychosocial and network dimensions of social capital with depressive symptoms in Montreal, Canada. *Social Science Medicine*, 86, 96–102.
- Bourdieu, P. (1980). Le capital social. *Actes de la Recherche en Sciences Sociales*, 31, 2–3.
- Brown, S., & Gray, D. (2015). Household finances and well-being in Australia: An empirical analysis of comparison effects. *Journal of Economic Psychology*, 53, 17–36.
- Brunner, E., & Marmot, M. (1999). Social organization, stress, and health. , in: Marmot, M., & Wilkinson, R. G. (Eds.). (1999). *Social determinants of health*. Oxford: Oxford University Press, 17–43.
- Chamberlain, G. (1980). Analysis of covariance with qualitative data. *The Review of Economic Studies*, 47, 225–238.
- Chatterjee, S., & Hadi, A. S. (2015). *Regression analysis by example*. John Wiley & Sons.
- Cohen, S., Underwood, L. G., & Gottlieb, B. H. (2000). *Social support measurement and intervention. A guide for health and social scientists* New York: Oxford University Press.
- Coleman, J. (1988). Social capital in the creation of human capital. *The American Journal of Sociology*, 94, S95–S120.
- Craig, J. (2007). The general health questionnaire. *Occupational Medicine*, 57, 79.
- del Pilar Sánchez-López, M., & Dresch, V. (2008). The 12-item general health questionnaire (GHQ-12): Reliability, external validity and factor structure in the Spanish population. *Psicothema*, 20, 839–843.
- Dickerson, A., Hole, A. R., & Munford, L. A. (2014). The relationship between well-being and commuting revisited: Does the choice of methodology matter? *Regional Science and Urban Economics*, 49, 321–329.
- Ding, N., Berry, H. L., & O'Brien, L. V. (2015). One-year reciprocal relationship between community participation and mental wellbeing in Australia: A panel analysis. *Social Science Medicine*, 128, 246–254.
- Fiorillo, D., & Sabatini, S. (2015). Structural social capital and health in Italy. *Economics Human Biology*, 117, 129–142.
- Frijters, P., & Beaton, T. (2012). The mystery of the U-shaped relationship between happiness and age. *Journal of Economic Behavior Organization*, 82, 525–542.
- Geishecker, I., Riedl, M., & Frijters, P. (2012). Offshoring and job loss fears: An econometric analysis of individual perceptions. *Labour Economics*, 19, 738–747.
- Giordano, G. N., & Lindström, M. (2011). Social capital and change in psychological

- health over time. *Social Science Medicine*, 72, 1219–1227.
- Hansen, T., Slagsvold, B., & Moum, T. (2009). Childlessness and psychological well-being in midlife and old age: An examination of parental status effects across a range of outcomes. *Social Indicators Research*, 94, 343–362.
- Harpham, T., Grant, E., & Thomas, E. (2002). Measuring social capital within health surveys: Key issues. *Health Policy and Planning*, 17, 106–111.
- Henry, W. E. (1971). The role of work in structuring the life cycle. *Human Development*, 14, 125–131.
- Hu, Y., Stewart-Brown, S., Twigg, L., & Weich, S. (2007). Can the 12-item general health questionnaire be used to measure positive mental health? *Psychological Medicine*, 37, 1005–1013.
- Kahneman, D., & Deaton, A. (2010). High income improves evaluation of life but not emotional well-being. *Proceedings of the National Academy of Sciences USA*, 107, 16489–16493.
- Kawachi, I., & Berkman, L. F. (2001). Social ties and mental health. *Journal of Urban Health*, 78, 458–467.
- Layard, R. (2005). *Happiness: Lessons from a new science* London: Allen Lane.
- Lin, N., Ye, X., & Ensel, W. M. (1999). Social support and depressed mood: A structural analysis. *Journal of Health and Social Behavior*, 40(4), 344–359.
- Lindström, M. (2004). Social capital, the miniaturisation of community and self-reported global and psychological health. *Social Science Medicine*, 59, 595–607.
- Lindström, M., & Giordano, G. N. (2016). The 2008 financial crisis: Changes in social capital and its association with psychological wellbeing in the United Kingdom – A panel study. *Social Science Medicine*, 153, 71–80.
- Lordan, G., & Pakrashi, D. (2014). Make time for physical activity or you may spend more time sick!. *Social Indicators Research*, 119, 1379–1391.
- Marmot, M., Ryff, C. D., Bumpass, L. L., Shipley, M., & Marks, N. F. (1997). Social inequalities in health: Next questions and converging evidence. *Social Science Medicine*, 44(6), 901–910.
- McCulloch, A. (2001). Social environments and health: Cross sectional national survey. *Br. Med. J.*, 232, 308–309.
- Midanik, L. T., Soghikian, K., Ranson, L. J., & Tekawa, I. S. (1995). The effect of retirement on mental health and health behaviors: The kaiser permanente retirement study. *Journals of Gerontology: Series B Psychological Sciences Social Sciences*, 50B, S59–S61.
- Mujcic, R., & Frijters, P. (2015). Conspicuous consumption, conspicuous health, and optimal taxation. *Journal of Economic Behavior Organization*, 111, 59–70.
- Nettle, D. (2005). *Happiness: The science behind your smile* Oxford: Oxford University Press.
- Nieminen, T., Martelin, T., Koskinen, S., Aro, H., Alanen, E., & Hyypä, M. T. (2010). Social capital as a determinant of self-rated health and psychological well-being. *International Journal of Public Health*, 55, 531–542.
- Phongsavan, P., Chey, T., Bauman, A., Brooks, R., & Silove, D. (2006). Social capital, socio-economic status and psychological distress among Australian adults. *Social Science Medicine*, 63, 2546–2561.
- Putnam, R. D., Leonardi, R., & Nanetti, R. Y. (1993). *Making democracy work: Civic traditions in modern Italy* Princeton: Princeton University Press.
- Riedl, M., & Geishecker, I. (2014). Keep it simple: Estimation strategies for ordered response models with fixed effects. *Journal of Applied Statistics*, 41, 2358–2374.
- Schultz, J., O'Brien, A. M., & Tadesse, B. (2008). Social capital and self-rated health: Results from the US 2006 social capital survey of one community. *Social Science Medicine*, 67, 606–617.
- Uphoff, N. (1999). Understanding social capital: Learning from the analysis and experience of participation. , in: Dasgupta, P., & Stiglitz, J. (Eds.). (1999). *Social Capital: A Multifaceted Perspective*. Washington, DC: The World Bank.
- Verbeek, M., & Nijman, T. (1992). Testing for selectivity bias in panel data models. *International Economic Review*, 33, 681–703.
- Wang, J. L., Scmitz, N., & Dewa, C. S. (2010). Socioeconomic status and the risk of major depression: The Canadian national population health survey. *Journal of Epidemiology and Community Health*, 64, 447–452.
- Wyke, S., & Ford, G. (1992). Competing explanations for associations between marital status and health. *Social Science Medicine*, 34, 523–532.